

Bellwork: 2/11/13

Graph the following polynomial function:

$$y = -(x-1)(x-3)(x+2)(x+1)$$

Find roots:

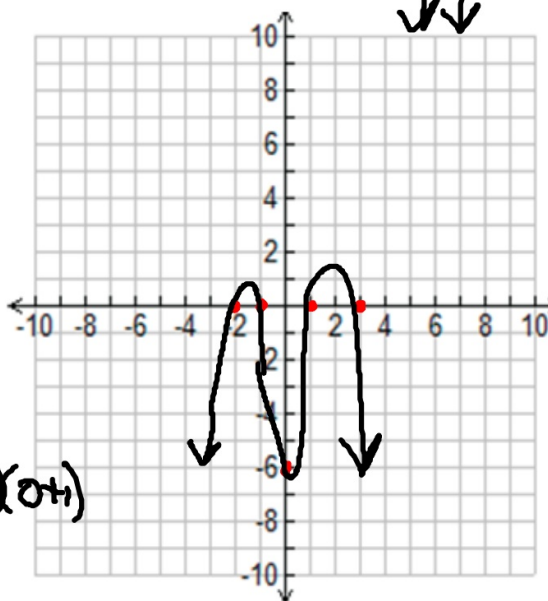
$$x-1=0 \Rightarrow x=1$$

$$x-3=0 \Rightarrow x=3$$

$$x+2=0 \Rightarrow x=-2$$

$$x+1=0 \Rightarrow x=-1$$

$$y\text{ int: } -(0-1)(0-3)(0+2)(0+1) \\ (0, -6)$$



End Beh:
 $-x^4$
↓ ↓

Page 1

$$\textcircled{16} y = (x+1)(x-2)(x-3)$$

roots: $x+1=0$ $x-2=0$ $x-3=0$
 $x=-1$ $x=2$ $x=3$

y int: $(0+1)(0-2)(0-3)$
 $(0, 6)$

EB: $|x^3$
odd \oplus
↓ ↑

Page 2

Graphing Polynomials in Standard Form:

1) $y = x^3 - 2x^2 - 15x$

NEW Step 1: Factor the equation

$$x(x^2 - 2x - 15)$$
$$x(x - 5)(x + 3)$$

Step 2: Find the zeros

$$x = 0 \quad x - 5 = 0 \quad x + 3 = 0$$

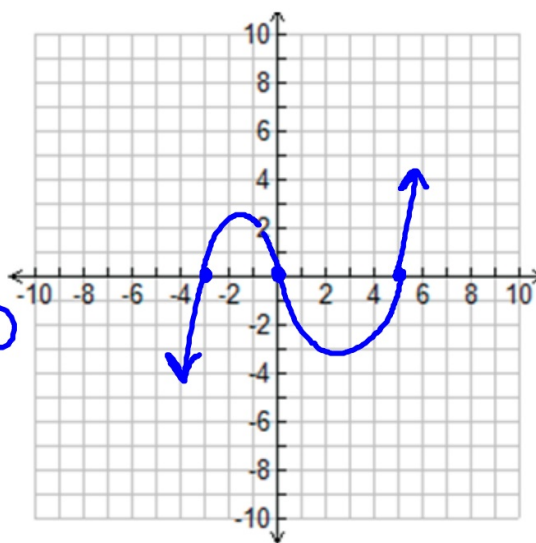
$$x = 0 \quad x = 5 \quad x = -3$$

Step 3: Find y-intercept ($x=0$)

$$0^3 - 2(0)^2 - 15(0)$$
$$(0, 0)$$

Step 4: Determine end behavior

$$\text{odd } \oplus \downarrow \uparrow$$



2) $y = 3x^3 - 3x^2 - 36x$

$$3x(x^2 - x - 12)$$

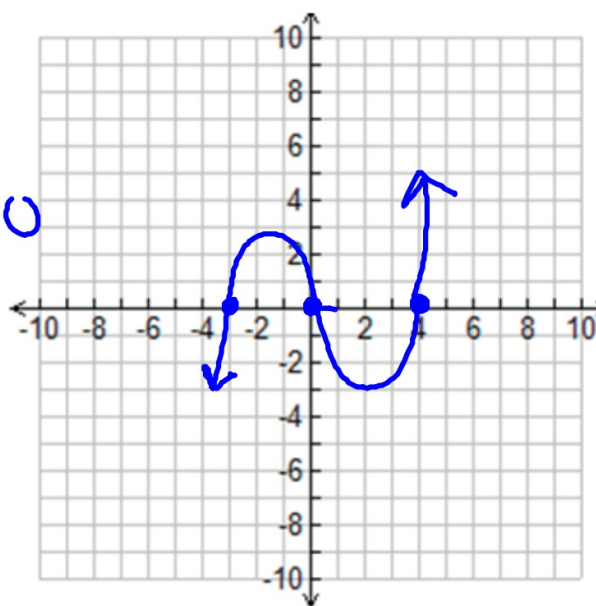
$$3x(x - 4)(x + 3)$$

$$3x = 0 \quad x - 4 = 0 \quad x + 3 = 0$$

roots: $x = 0, 4, -3$

yint: $3(0)^3 - 3(0)^2 - 36(0)$
 $(0, 0)$

EB: $\text{odd } \oplus \downarrow \uparrow$



3) $y = -x^3 - 2x^2 + 15x$

$-x(x^2 + 2x - 15)$

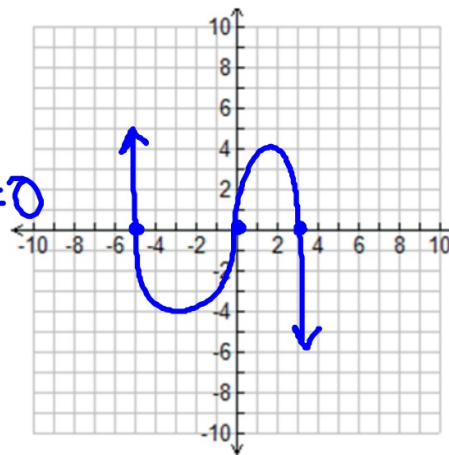
$-x(x+5)(x-3)$

$-x=0 \quad x+5=0 \quad x-3=0$

roots: $x=0, -5, 3$

yint: $-(0)^3 - 2(0)^2 + 15(0)$
 $(0,0)$

EB: odd \ominus
 $\uparrow \downarrow$



4) $y = 2x^3 - 5x^2 - 3x$

$x(2x^2 - 5x - 3)$

$(2x^2 - 6x + 1x - 3)$

$2x(x-3) + 1(x-3)$

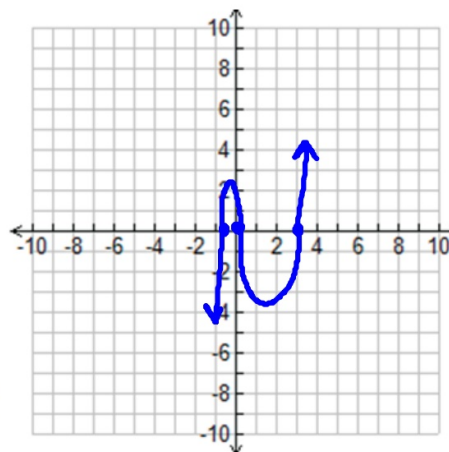
$x(2x+1)(x-3)$

$x=0 \quad 2x+1=0 \quad x-3=0$

roots: $0, -\frac{1}{2}, 3$

yint: $2(0)^3 - 5(0)^2 - 3(0)$
 $(0,0)$

EB: odd $\oplus \downarrow \uparrow$



5) $y = -x^3 + 16x$

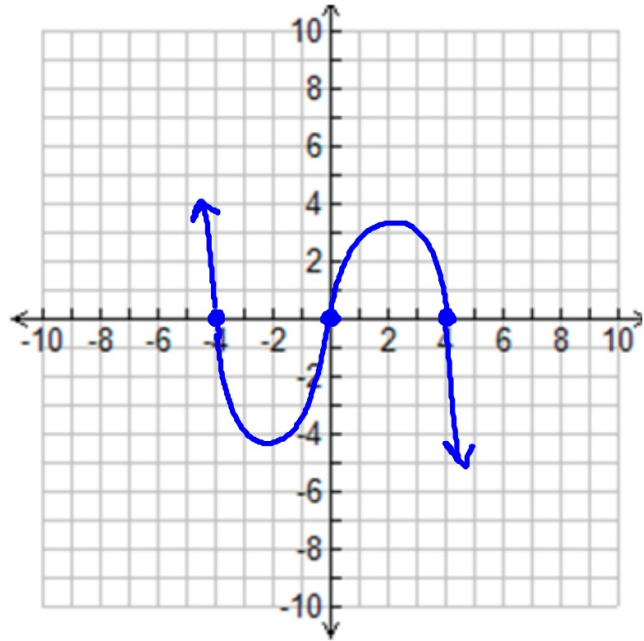
$$-x(x^2 - 16)$$

$$-x(x+4)(x-4)$$

roots: 0, -4, 4

yint: $-(0)^3 + 16(0)$
(0,0)

EB: odd \ominus $\uparrow \downarrow$



Homework: pg 293 #7-12 all - must graph

